A collaborative quest for sustainability at DTU

Michaelsen, Lisbet; Olsen, Stig Irving; Nielsen, Susanne Balslev

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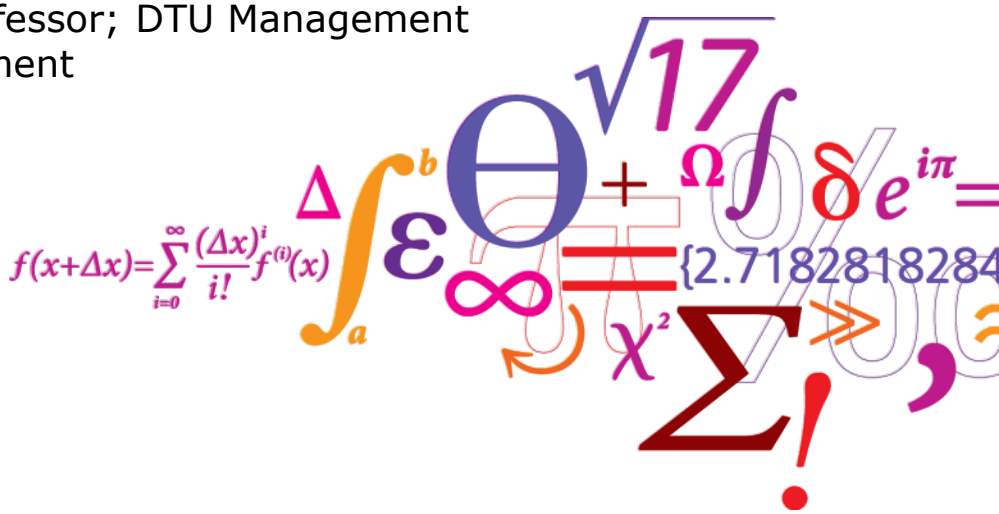
Lisbet Michaelsen, Sustainability Coordinator; DTU Campus Service

Stig Irving Olesen, Associate professor; DTU Management Engineering, Quantitative Lifecycle Assesments

Susanne Balslev Nielsen, Associate professor; DTU Management Engineering, Centre for Facilities Management

Sustain DTU – 17. December 2014



DTU Management Engineering
Department of Management Engineering

Abstract 135: Lisbeth Michaelsen, Sustainability Coordinator, DTU Campus Service:

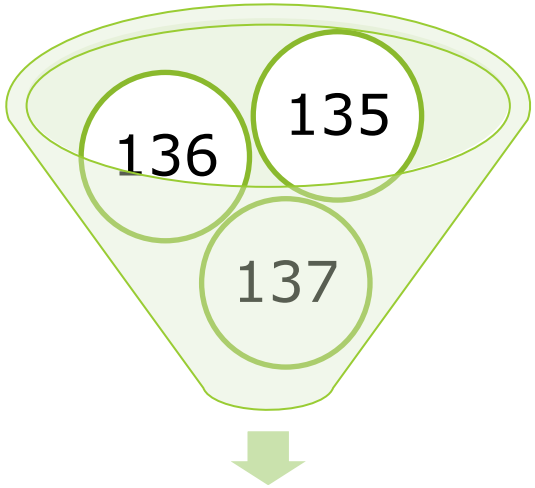
Sustainability at DTU from Campus Service point of view -an invitation to use campus as *learning lab*

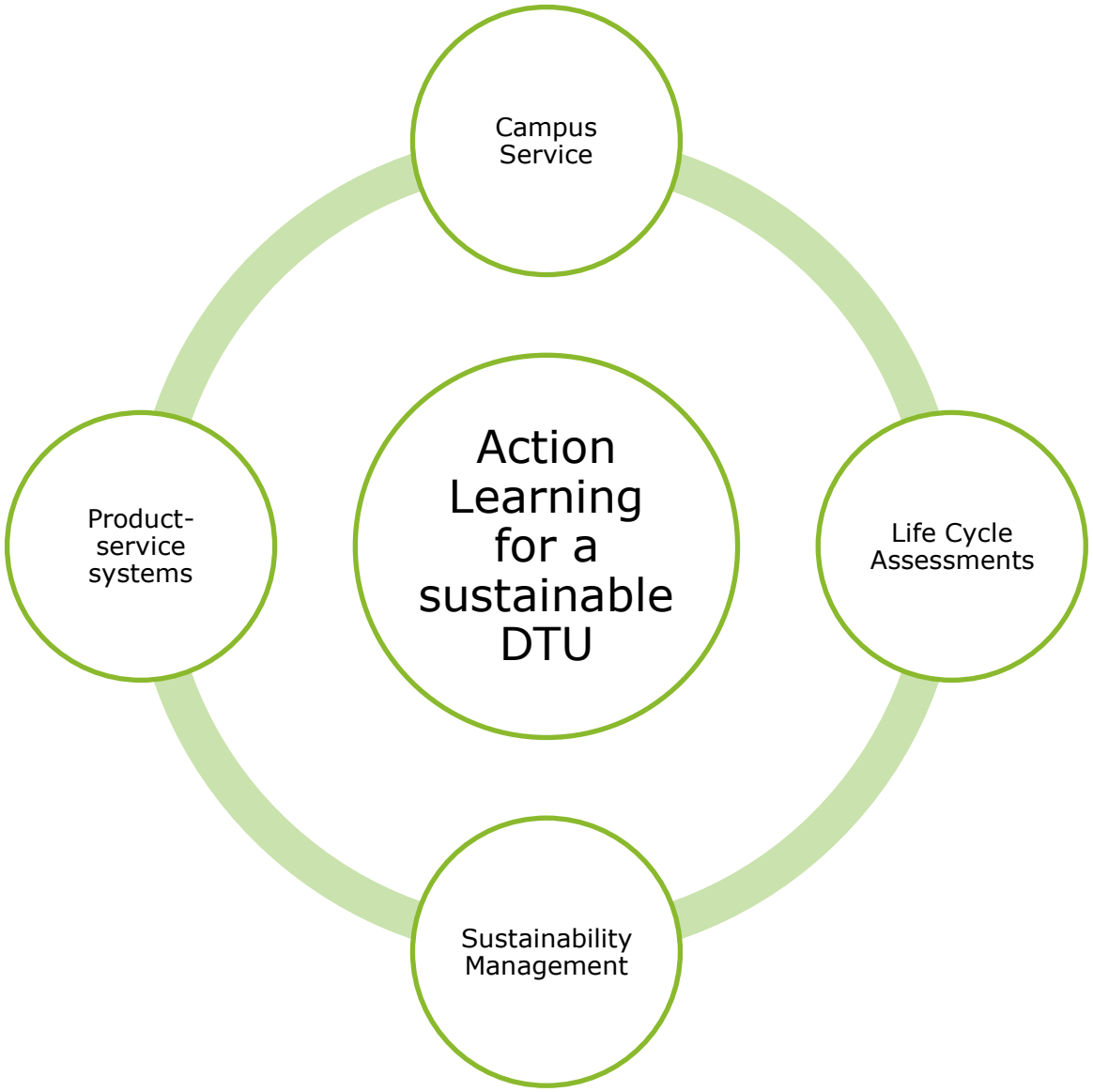
Abstract 136: Susanne Balslev Nielsen and Per Anker Jensen; Centre for Facilities Management; DTU Management Engineering. Lisbeth Michaelsen, DTU Campus Service:

The quest for sustainability in existing buildings

Abstract 137: Stig Irving Olsen and Susanne Balslev Nielsen, DTU Management Engineering. Tim McAloone, DTU Mechanical Engineering:

Teaching sustainability in engineering solutions with Campus Service as case





Content:

The societal challenge and FM as solution

Campus Service and sustainability at DTU

Teaching Sustainability in Engineering Solutions

Next steps

The societal challenge and FM as a solution

Susanne Balslev Nielsen and Per Anker Jensen

Transforming cities through FM

- working with people, places and processes

CENTRE FOR FACILITIES MANAGEMENT
CFM
REALDANIA RESEARCH

DTU the case of a

- building *owner*, building *user* and building *operator*
- sustainability in Facilities Management: a management journey from vision to reality.

DTU Campus Service (CAS) and sustainability at DTU

Lisbet Michaelsen

About Campus Service

Strategy

1. *" DTU's infrastructure is to support education, research, research-based advisory and innovation"*
2. *"DTU must prioritise a beautiful and functional campus with a visible and versatile social life, including an attractive student environment"*
3. *" DTU administration of its activities as an independent institution is to be developed into a model of efficient university operations"*

Mission

CAS is DTU's Facility Management organisation. CAS must ensure that the operation, maintenance and development of DTU's buildings, as well as areas and facilities ***support DTU's core activities; research, education, research-based advisory and innovation.***

Vision

CAS must ensure that the campuses, buildings, facilities and service of DTU is nationally and internationally attractive, and CAS shall lead in its contribution to increasing the applicable standard.

CAS organisationsdiagram april 2014

KONCERNSTAB - DANMARKS TEKNISKE UNIVERSITET

CAMPUS SERVICE

Jacob Steen Møller

FUNKTIONEN BYGHERRE
Ole Kristian Bottheim

FUNKTIONEN DRIFTSHERRE
Anders B. Møller

FUNKTIONEN PORTEFØLJE- & SPACEMANAGEMENT
Uffe G. Thomsen

LYNGBY
FREDERIKSBERG
MØRKHØJ
BALLERUP
RISØ
LINDHOLM

- Bygherre 1 – Claus Møller Rasmussen – Byggeplanlægning
- Bygherre 2 – Søren Uslev
- Bygherre 3 – Nils Møller
- Driftplanlægning & -projekter – Allan A. Murphy
- Park & Vej – Michael Jepsen
- Bygninger – Synne Remvig
- EL – Allan Egetoft
- VVS – Anders Wang-Holm
- CAS Frederiksberg – Finn L. Mosegaard
- CAS Mørkhøj – Finn L. Mosegaard
- CAS Ballerup – Finn L. Mosegaard
- CAS Risø – Poul Erik Søderdahl
- CAS Lindholm – Jesper Dose
- BMS – Tommy Plesner
- Servicecenteret – Nils Turpie
- Administrationen – Uffe G. Thomsen

Fagligt ansvar

Campus Service – 2014 figures

Handle 13.234 error reports

Approx. 700 daily guests in the meeting centre

Handle 1.433 orders

Projectinvestments
Approx. 600 mio. Dkr.

CAS has worked 274.636 hours

Used more than 125.000 hours on cleaning

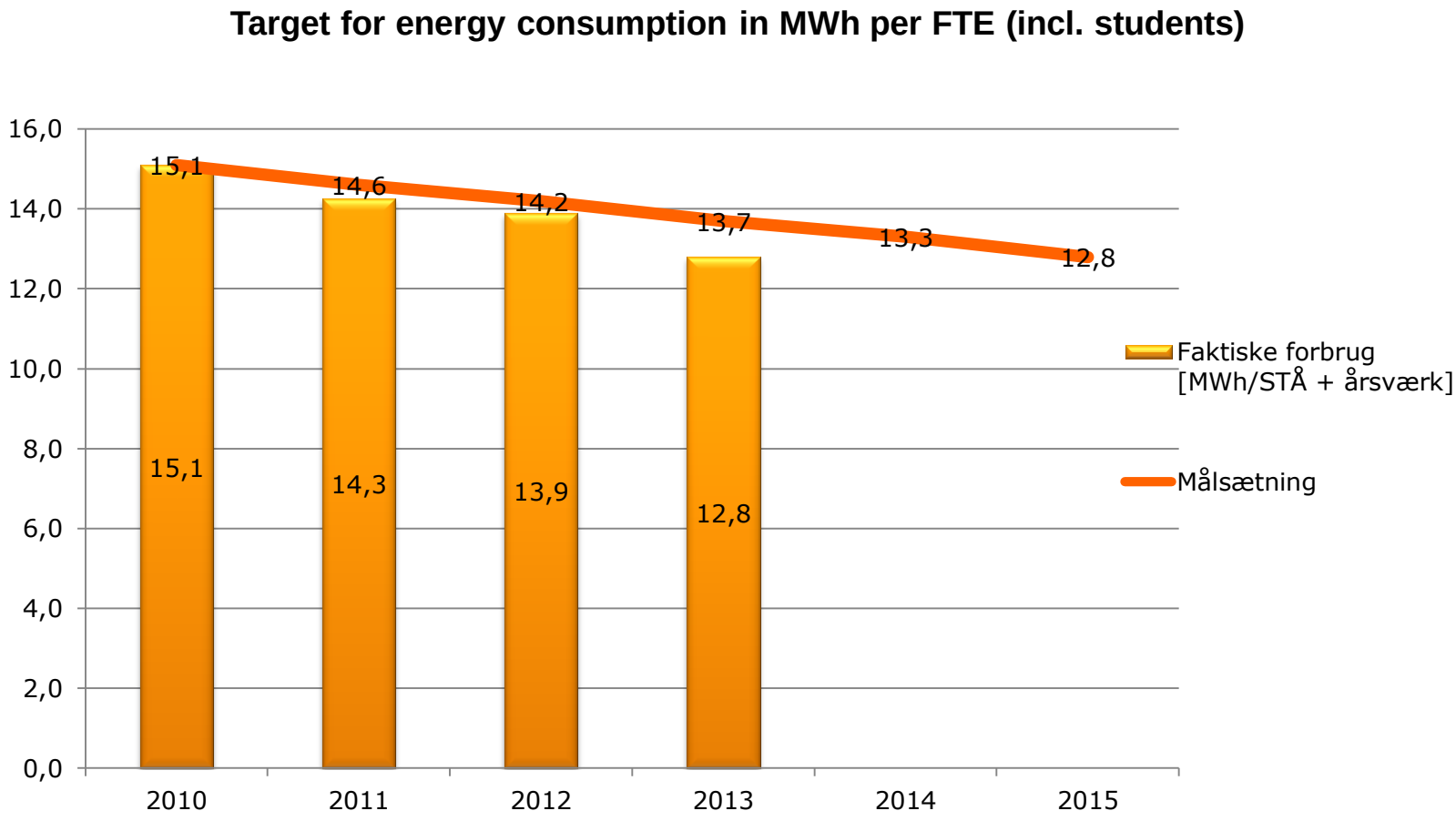
Used more than 10.000 man hours on mooving jobs

Emptied more than 650.000 waste bins

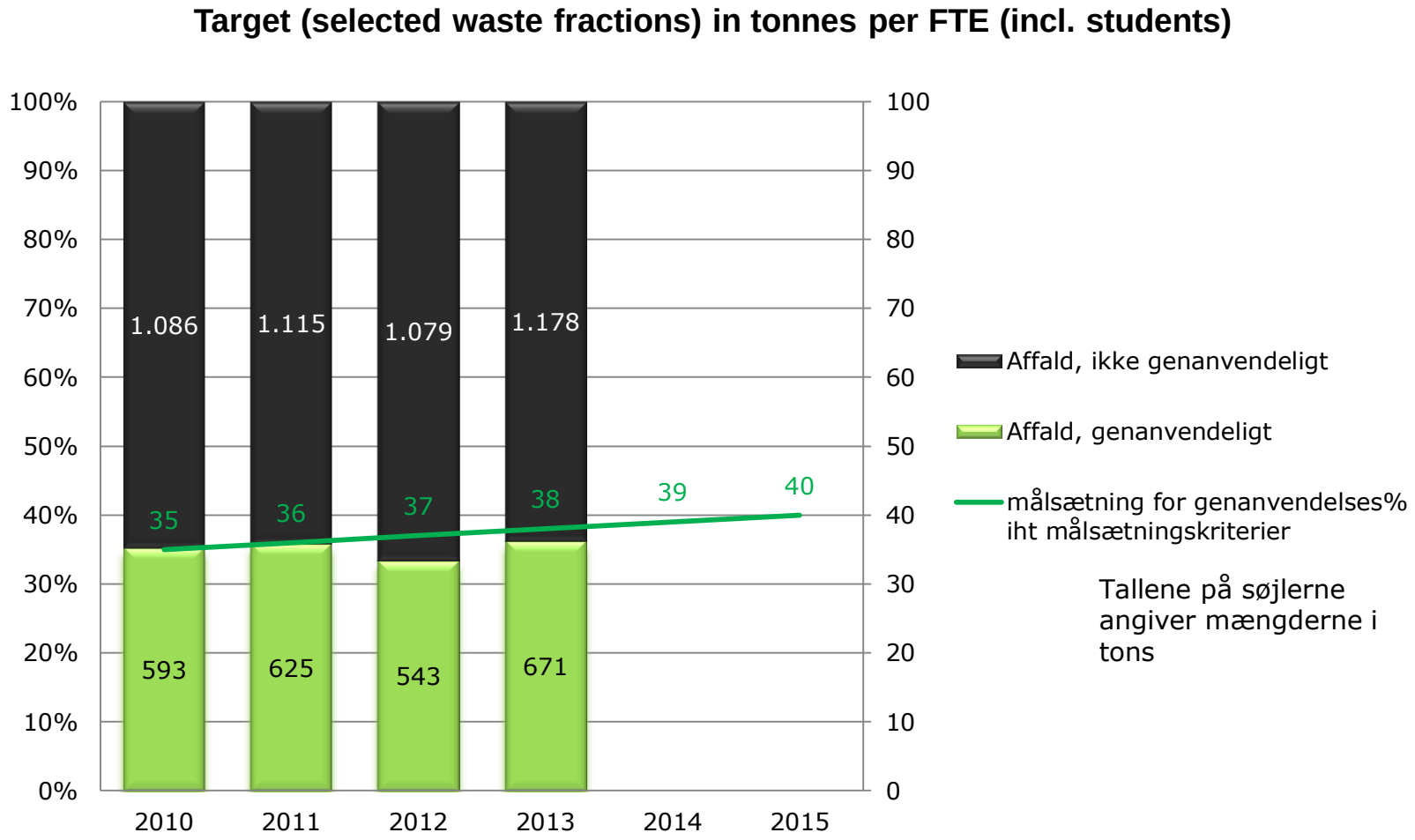
Served food to more than 800.000 guests in the canteens

"Used" more than 6 mio. meters of toilet paper

Energy target in contract with FIVU



Waste target in contract with FIVU



Numerous choices/dilemmas: What is the more sustainable?

Student projects investigating:

- Waste sorting at DTU Library
- Use of Oak trees from the Lifescience lot
- Sustainable materials for facades
- Sustainable flooring in laboratories
- Organic waste handling
- Hand drying - Paper vs. Electric dryer
- IT & Server rooms
- Weed control at DTU campus
- Bottled water vs. tap water
- Interior walls: glass vs plaster board

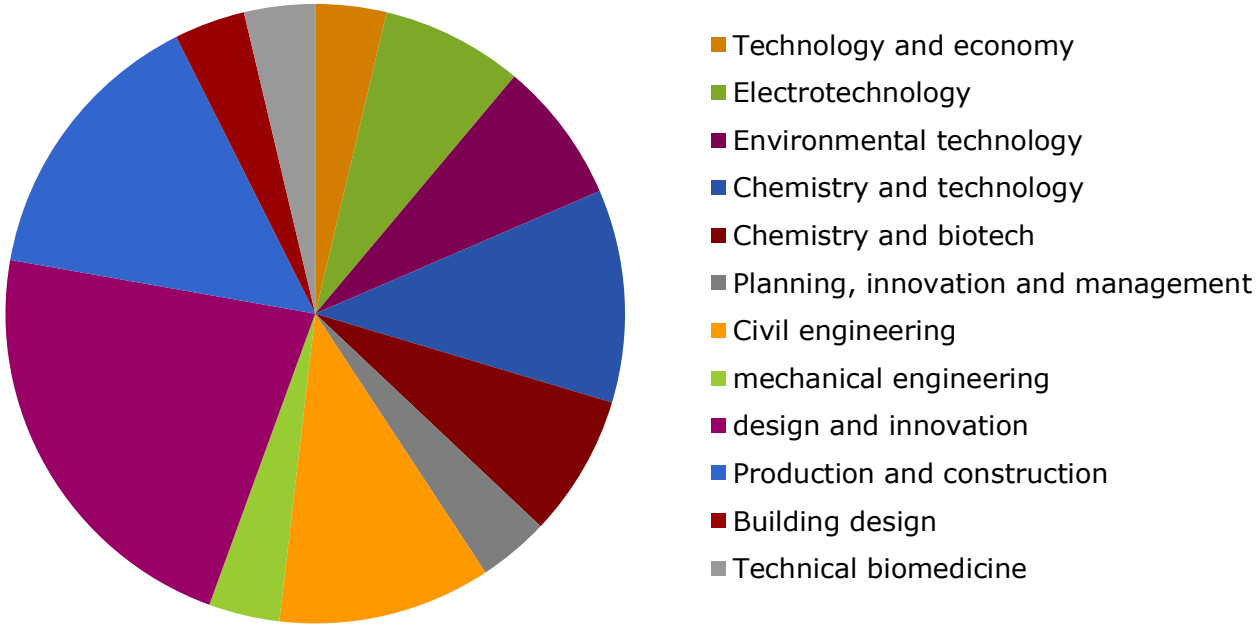
Teaching

Sustainability in Engineering Solutions

Stig Irving Olsen

Teaching sustainability in engineering solutions (42340)

- 5 ECTS June course
- Cooperation between three teachers, two department
- Cases from CAS (Lyngby school, Nordhavn)
- Open to all bachelor study lines (usually 4th to 6th semester students)
- Up til now between 18 and 47 students following (increasing each year in the four years it's been running)
- Up to 13 different study lines (also increasing each year)



Course structure

Teaching day #	Teacher	Morning			Lunch	Afternoon		
		9:00-9:45	10:00-10:45	11:00-12:00	12:00-13:00	13:00-13:45	14:00-14:45	15:00-17:00
1	siol/Mic/sbni/tmca	Introduktion til kurset, lærerne, og de medstuderende	Intro til bæredygtighed: Bæredygtighedsledelse; Udvikling af løsninger; Vurdering af miljøbelastninger			DTU Campus introduktion	Spørgsmål og diskussion	Introduktion til projektet: del-projekter osv.
2	siol/sbni/tmca	Inddeling af grupper	Forberedelse til feltarbejde			DTU Campus introduktion - bæredygtighedkoordinator	Besøg på forskellige institutter/bygninger/faciliteter	
3	sbni	Gæsteforelæser: Martin Mandrup, C2C COWI	Hvorfor bæredygtighedsledelse? Strategiske overvejelser; Aktører osv. Bæredygtighedsledelse "setting the scene",			Gruppearbejde: Udviklingsbehov - hvor vil vi gerne hen? Definition af projekt: Formål, undersøgelsens objekt, rammer osv.	Gæsteforelæser: Marine Langgrand: Bæredygtig FM på danske universiteter	Gruppepræsentationer af posters
4	tmca	Miljøforbedringer i planlægningsfasen: Fastlæggelse af miljøforhold i konceptskabelsen; systemløsninger og livscyklusovervejelser; brugskontekst; miljømæssige aktørnetværk osv.				Fastlæggelse af livsforløb for case; brugskontekst for case; hvornår fastlægges miljøforhold og af hvem; hvordan ser livsforløbet ud		
5	siol	Miljøvurdering i livscyklus: Livscyklusvurdering generelt; simplificering i temaer og livscyklusstadier; Vurdering af materialer; Vurdering af Energi Plan for indsamling af data				Indsamling af data for case: Hvilke data skal bruges; identifikation af potentielle data leverandører; Indsamling af litteraturdata - materialer og energi		
		Weekend						
6	siol	Miljøvurdering i livscyklus: Kemikalier, sikkerhedsdatablade, CAS m.m., listen over farlige stoffer; Andet, arbejdsmiljø, potentielle sociale aspekter				Indsamling af data for cases og begynde MEKA-vurdering: Indsamling af litteraturdata for kemikalier; indsamling af data hos aktører		
7	siol	Gæsteforelæser; Karen Andreason, Velux	Projektarbejde på case			vejledermøder: Milepæl livscyklusoverblik		Gruppe præsentationer af posters
8	tmca	Gæsteforelæser: Susanne Kuhn, Rockwool	Miljøforbedring af koncepter: idealkoncepter; negativ brainstorm; nye løsninger			Arbejde på case med forbedringsforslag		
9	tmca	Arbejde på case forbedringsforslag				Case: Vejledermøde milepæl forbedringsforslag		
10	siol	Case livscyklusoverblik på forbedringsforslag				fortsat		
		Weekend						
11	tmca	Case udarbejdelse af endeligt forbedringsforslag				fortsat. Vejledermøde tmca/siol: milepæl endelig miljøforbedringsforslag		Gruppepræsentationer af posters
12	sbni	Bæredygtighedsledelse i praksis: udarbejdelse af strategi; implementeringsovervejelser; leverandørstyring; marketing; innovation; personaleledelse etc.....				Case: muligheder for at styre på parametre		
13	sbni	Case arbejde med bæredygtighedsledelse i forhold til konkrete miljøforbedringsforslag				fortsat:		
14	tmca/sbni/siol	Case arbejde med konkrete miljøforbedringsforslag løse ender m.m.				Udarbejdelse af posters		
15	tmca/sbni/siol	Præsentation af projektarbejde				Multiple choice skriftlig prøve		

Introduction

Sustainability management

Overview of product/system

Assessing environmental impacts

Making environmental improvements

How to implement?

Next steps in the collaborative quest

for sustainability at DTU

Think of your experience as DTU user…

What are your ideas for Campus service and student projects (one idea pr. post-it)

- reaching DTU targets: Energy
- reaching DTU targets: Waste
- other sustainability improvements

Input to 42340 June 2015

Thank you!